

Subnational government's budget deficit targets in a Monetary Union: the Spanish case 1995-2010

En el presente artículo analizamos los factores que explican los saldos fiscales de las CC.AA. Los resultados empíricos sugieren que los objetivos de déficits a largo plazo no deberían distribuirse linealmente entre las regiones y que no debería esperarse que estos objetivos se cumpliesen en el mismo horizonte temporal. Asimismo, los resultados sugieren que los Acuerdos de financiación deberían ser rediseñados para evitar que el Estado pudiese transferir déficit a las CCAA. Finalmente, los resultados sugieren que debería haber una mayor coordinación presupuestaria para evitar que las CC.AA. sorteasen las restricciones de gasto y deuda a través de su sector público instrumental.

Artikulu honetan, autonomia-erkidegoetako zerga-saldoak esplikatzen dituzten faktoreak aztertuko ditugu. Eraitza enpirikoei iradokitzen dutenez, epe luzeko defizit-helburuak ez lirateke linealki banatu beharko eskualdeen artean, eta ez litzateke espero beharko helburu horiek denbora-muga berean betetzea. Eraitzek pentsarazten dute, halaber, finantziario-hitzarmenak berridazintatu beharko liratekeela, Estatuak autonomia-erkidegoetara defizitak ez transferitzeko. Eraitzetatik ondorioztatu daiteke, azkenik, aurrekontu-koordinazio handiagoa egon beharko litzatekeela, autonomia-erkidegoek gastuen eta zorren murrizketak ez saihesteko beren sektore publiko instrumentalaren bitartez.

We set out an analysis of the factors that explain subnational budget balances. Our results suggest that long run deficit targets should not be distributed linearly across Autonomous Communities, and cannot be expected to be fulfilled in the same time-horizon. More important, financing agreements should be redesigned in order to avoid the central government having the opportunity to transfer its deficit to Autonomous Communities. Finally, more budgetary coordination is needed in order to prevent that Autonomous Communities circumvent central governments' fiscal rules using their public entities.

Table of contents

1. Introduction
2. Related literature
3. The process of fiscal decentralisation in Spain and the implementation of fiscal rules
4. The process of fiscal decentralisation in Spain
5. Estimating cyclically adjusted balances in Spain
6. The determinants of RGs cyclically adjusted budget balances
7. Conclusions

Bibliographic references

Appendix

Palabras clave: Federalismo fiscal, saldos presupuestarios, autonomía fiscal, *output-gap*, datos de panel.

Keywords: Fiscal federalism, budget balances, tax autonomy, output gap, panel data.

JEL codes: H71, H74, E61.

1. INTRODUCTION

The economic downturn that started in 2007 in some countries in the Eurozone (Spain, Greece and Portugal, among others) activated mechanisms to control budget deviations. These mechanisms, arising from the implementation of the Stability and Growth Pact, introduce, among other restrictions, deficit targets to be achieved by the aggregate of all public administrations in a country within a specific timeframe.

In Spain the distribution of deficit targets is not the result of a bargaining process but, instead, is a unilateral decision by the Central Government (CG hereafter, see section 3.2 for a more detailed description of this process). Given that the deficit

The authors wish to thank the anonymous reviewers for their insightful comments and suggestions during the evaluation process.

target for each country refers to the aggregate of all levels of government, there is some kind of trade-off to what concerns deficit targets among the CG and Regional Governments (RGs¹) because the larger the deficit assigned to subnational governments, the lower the remaining deficit target for the CG. However, this trade-off regarding deficit targets does not prevent RGs to exceed their targets because the CG cannot force them cutting public expenditure or increasing taxes in the short run.

The consequence of such a mechanism may have been irrelevant during 2002 and 2008 because RGs' budgets were balanced during this period due to expanding fiscal revenues. However, during the 2009-2012 period, the Spanish CG assigned itself most of the deficit target (71% in 2012), while the CG was responsible only for 54% of total expenditure (including social security and unemployment subsidies). In addition to that, the CG linearly distributed the deficit target across regions. This meant that all regions, regardless of their economic position in their own economic cycle, were expected to achieve the same deficit target in the same year.

Some efforts have been devoted to analysing the opportunity to implement fiscal rules or increase the level of tax autonomy in decentralized economies and their impact on subnational fiscal balances.

However, most contributions are based on the hypothesis that the CG acts as a social planner that fixes fiscal rules, budget restrictions etc. for RGs in order to correct some possible externalities of RGs' fiscal balances on aggregate deficit targets. Nevertheless, little attention has been devoted to one of the main issues about subnational fiscal deficits, which is how to allocate deficit targets across different levels of government and how to distribute them within each level of government, given that the deficit target fixed by the EU refers to all public authorities in a country. Within this framework, the question can be posed in a different manner - who decides which level of government is going to bear the cost of expenditure cuts and tax increases?

In this paper we analyse the determinants of subnational governments' fiscal balances and we try to shed some light on the opportunity of a CG deciding unilaterally the distribution of deficit targets across public administrations and linearly among subnational governments. We run our analysis based on Spanish data for the period 1995-2011.

Previous analyses of the impact of fiscal rules in theoretical and empirical papers present several additional shortcomings. On the one hand, indexes for fiscal rules, budgetary institutions etc. are frequently based on the existence – or not- of a regulation that develops them. However, we argue that what matters is not if such rules exist but whether they are appropriately designed and implemented. On the other

¹ We use Regional Governments (RG), Subnational Governments (SG) or Autonomous Communities (AC) indistinctly in this paper.

hand, a similar problem occurs when we measure tax autonomy. Tax autonomy indexes may be based on an inaccurate interpretation of the financing agreements that determine the distribution of resources for RGs. However, we argue that some legal technicalities may distort the effective degree of tax autonomy. For instance, in Spain there are some restrictions on altering shared taxes (VAT and Excise Taxes) and some RG's own taxes, which although RGs receive all revenues derived from them they do not manage them effectively. Finally, the literature avoids dealing with another technicality which relates to who estimates tax revenues from shared taxes at period $t-1$ to be delivered at period t , and what is the mechanism to correct possible deviations (see section 4.2 for further discussion).

Although such details are neglected in most empirical analysis, due to the lack of data available, they are not harmless, at least from the perspective of Spanish ACs. Although during 2010-2013 ACs implemented the largest cuts in public expenditure, even so most of them were not able to achieve their targets, which have been largely surpassed. This non-fulfilment of deficit targets has been used by critics of the Spanish process for decentralization who suggest that RGs are the main source for fiscal instability and that there is too much decentralization and too excessive tax autonomy in Spain.

Several additional contributions are to be remarked. First, the literature has omitted considering to what extent CG's fiscal position determines RG's budget balances. Our results suggest that RGs' budget balances depend on the size of the deficit run by the CG and on the mechanism that allows the CGs to decide the amount of resources to be received by RGs (see section 4.2 concerning transmission mechanisms). Our results suggest that the CG may transfer part of its deficit to RGs. Second, the literature has not considered RGs strategic behaviors against CG fiscal rules. We show that RG's may act strategically by using public entities' budget deficits in order to circumvent fiscal rules designed by the CG. Finally, another contribution of our paper is a methodological one because we work with cyclically adjusted balances based on our own estimates of output gaps and revenue elasticities for each AC. The previous literature has dealt with short term budget deficits and considering revenues and expenditure elasticities computed on country data. However, long term deficit targets fixed by the EU refer both to structural as well as current balances.

To sum up, the main contribution in this paper is that we try to solve these shortcomings by computing new variables that consider those technicalities that characterize fiscal relationships among different levels of governments.

From a policy-maker's perspective, our results suggest that long term deficit targets cannot be distributed linearly across ACs (this idea is supported also by Fernandez and Lago 2013) and cannot be expected to be fulfilled in the same time-horizon because financing agreements generate asymmetries among ACs (regardless of ACs' position in the economic cycle) and, more important, that financing agreements

should be re-designed in order to avoid the CG having the opportunity to transfer its deficit to ACs (beyond the expected effects due to AC's cycle) and ACs' having the opportunity to circumvent CG's fiscal rules.

In section 2, we briefly review the literature analysing the factor that explains national and subnational fiscal balances. In section 3 we describe the distribution of deficit targets across public authorities and across RGs in Spain. We also provide the level of achievement of deficit targets. In section 4 we describe briefly the Spanish process of decentralization and the mechanism used by the CG to distribute fiscal resources to subnational levels of government. In section 5 we estimate AC's cyclically adjusted budget balances and in section 6 we estimate the determinants of such fiscal balances. Finally, section 7 contains our conclusions.

2. RELATED LITERATURE

There are extensive contributions analysing the relationship between fiscal deficits and fiscal federalism issues, such as the role of RGs in the law-making process, the default-bailout game, etc. As far as the latter point is concerned, the links between bailout expectations for RGs to the regional tax base and its connection to the deficit bias were analysed by von Hagen and Eichengreen (1996). Their argument is that the CG cannot credibly commit itself to a no-bailout policy if the revenues of subnational levels of government are not generated from fiscal sources that they have direct discretion over. On the contrary, if revenues largely come from own tax sources the CG can avoid bailouts by requiring subnational governments to increase taxes under their control.

Von Hagen (2005) states that an overspending problem may occur when subnational governments receive resources from a national common pool -for example, through intergovernmental fiscal transfers- which creates vertical externalities (see Wildasin 1997, Goodspeed 2002; see also Bordignon 2006 for a survey on this literature). According to Rodden *et al.* (2003) hard budget constraints make subnational governments internalise the total costs of their policies. On the other hand, soft budget constraints motivate subnational governments to increase expenditure without facing the full cost of their decisions. Therefore, fiscal responsibility is an instrument aimed at achieving that subnational governments internalise the cost of the public goods and services they supply, which ought to avoid overspending.

Additionally, there are a large number of contributions that analyse the role of soft budget constraints. Some of them focus their analysis on the design and effectiveness of fiscal rules (see von Hagen 2006, Hallerber *et al.* 2007 and Debrun 2008), concluding, from a country specific perspective, that institutional and political background do have a clear effect on the effectiveness of budget constraints. Other contributions find evidence for subnational bailouts from a descriptive case study

(see Foremny, 2013, for a survey) and most of them conclude that higher degrees of tax autonomy harden budget constraints. Finally, Roden (2002, 2006) find that vertical fiscal imbalances do have a positive effect on subnational governments' deficits. This conclusion is also reached at Foremny (2013) who concludes that deficits of subnational governments in federations can be avoided through tax autonomy.

From an empirical perspective, the literature has defined an extensive number of factors that aim to explain national and subnational fiscal balances (see Argimón *et al.*, 2012, for a complete survey). These factors can be grouped into two categories. On the one hand, we find political and institutional factors such as the composition of majorities, the existence of budgetary institutions, the role of political business cycles, partisanship, etc. On the other, we find macroeconomic factors such as economic inequality, regional income level, the population structure, interest rates, asset prices, inflation, economic cycles, etc.

In the particular case of Spain, most efforts have been devoted to analyse the determinants of AC debt levels (Hernández de Cos *et al.*, 2013) as well as the existence of bailout effects (Sorribas, 2011). Another strand of the literature, which is not so highly developed, has analysed the factors that explain fiscal deficits and borrowing levels at subnational level in Spain. Lago-Peñas (2005) found a relationship between the level of transfers received by the ACs and their expenditure and budget deficits, suggesting that fiscal deficits were a rational decision by ACs given that financing agreements between CG and AC governments did not provide sufficient resources to finance their needs. Barrios and Martinez (2013) find similar results in a paper in which Spain, Germany and Canada are analyzed. These results are very close to those previously obtained by Monasterio and Suarez Pandiello (1993) and García-Milà and McGuire (1990). A similar approach is followed in Perez-Cucarella (2013), where the authors analyse the fiscal balances of Spanish ACs and they try to determine whether deficit and debt levels are due to their greater tendency to spend or to insufficient income. Following a different approach, Argimón *et al.* (2012) found that fiscal rules did not have any significant effect on ACs' fiscal balances during 1984-2004 and also that tax autonomy contributes to controlling budget deficits, although such tax autonomy causes fiscal deficits to depend largely on business cycles. Finally, Mussons (2013) confirms the procycality of subnational fiscal deficits and the positive effects of tax autonomy on fiscal balances (1987-2010).

In this paper we argue, following Foremny (2014) in a cross-country study and Roden (2002, 2006), that ACs' subnational fiscal deficits in Spain are influenced by the decisions of the Spanish CG. In this sense, Molina-Parra and Martínez-López (2015) in the context of yardstick competition models, for the Spanish case, found that fiscal imbalances at the federal tier of government encourage public deficits of regional governments. Complementary to the previous authors, we focus our analysis on the role of institutional design on fiscal deficits, we do so by emphasizing the transmission mechanisms through which the CG might influence RG's fiscal deficits.

We argue that the Spanish CG affects subnational fiscal deficits through different mechanisms: i) the CG decides the distribution of deficit targets between the CG and the other levels of government and, therefore, it decides who is going to bear the burden of budget adjustments, ii) the CG unilaterally decides subnational government's deficit targets which traditionally have been fixed linearly (2002-2012) or discretionary for 2013 and, iii) the CG unilaterally estimates the amount of resources that ACs are going to receive from shared taxes and transfers, which, as suggested in the data, based on financial agreements that introduces significant asymmetries among ACs and allows the CG to underestimate these resources and transferring part of its fiscal deficit to ACs (see section 4 for further details on transmission mechanisms and see also BBVA 2015 and López-Casasnovas *et al.* 2014).

Our paper follows a similar approach to the literature that analyses the determinants of subnational fiscal balances. However, we introduce several changes that provide new results. First, we work with structural deficits rather than with current fiscal balances. Second we introduce new variables that improve the definition of tax autonomy. Third, we introduce a variable that captures transmission mechanisms of deficit from CG to RGs mentioned in the previous paragraph. Fourth, we intend to capture the possibility of strategic behaviours of RGs against CG fiscal rules. Finally, we extend our analysis to consider the last period of economic downturn (2009-2012) and the characteristics of the new financing agreement (2009) between the CG and ACs.

As mentioned above, another difference in our paper with respect to previous literature is that we work with subnational government's cyclically adjusted balance (we also refer to them as structural balance) that requires estimating ACs' output gaps and ACs' revenues elasticities individually. In addition to the fact that the EU fixes long term deficit targets based on structural deficits, we argue that, in order to test the relevance of financing agreements, tax autonomy and the role of the CG, it is more appropriate to work with budget deficits once cyclical effects have been adjusted. If a robust relationship exists between budget deficits and our explanatory variables this would suggest that the mechanism of devolution and/or the financing agreements between CG and ACs may have been designed incorrectly.

3. THE PROCESS OF FISCAL DECENTRALISATION IN SPAIN AND THE IMPLEMENTATION OF FISCAL RULES

3.1. Fiscal rules in Spain

ACs and Local Governments (LGs) in Spain are empowered to take on debt, as long as they respect certain limits. The basic rule is that debt repayment and interest cannot exceed 25% of the ACs' and LGs' current revenues. In addition to this, authorisation from the CG is required to arrange credit operations abroad and for

debt issuance. Nevertheless, credit operations with national banks and short term credit operations (less than one year) do not require such authorisation.

With regard to the rules governing ACs' budget balances, these have evolved over different periods. In the first period, from 1992 to 2001, the CG-assigned budget deficits and debt to each AC were based on bilateral negotiation for a two-year period (known as the Budgetary Consolidation Scenarios).

In the second period, from 2001 to 2005, under the Budget Stability Law (BSL) the CG assigned a single limit, in terms of budget deficit, for all ACs. No individual targets were settled for each region therefore they faced the same deficit target regardless of their cyclical position.

Finally, the reform of BSL in 2006 stated that CG and ACs would be able to adapt their deficits and surplus targets to their economy's cyclical positions. As a consequence budget surpluses were to be achieved if the growth rate of the economy exceeded 2% and deficits were allowed if the economy's growth rate was below 0%. The allocation of deficit targets between the CG and the ACs was decided unilaterally by the CG and the same deficit target was assigned to all ACs regardless of the region's economic position. Thus, effective deficit targets were significantly different across ACs because the mechanism that allocates fiscal revenues across ACs introduces significant asymmetries across regions (see López-Casasnovas *et al.* 2014), regardless of the evolution of the AC's fiscal basis.

We should point out that since the implementation of the BSL, some ACs have demanded a different distribution of deficit targets between CG, ACs and LGs based on a real bargaining process at different levels of government. In addition to this, they demanded an asymmetric allocation of deficit targets among ACs. Demands were rejected by the CG arguing that it was impossible to implement a distribution of deficit targets that satisfied all ACs' and LGs' interests.

However, in 2013 the CG assigned individual short term budget deficit targets to ACs. This allocation was not transparent and was not based on any rule known *ex-ante*. Apparently, it seems that they were decided unilaterally by the CG based on AC budget deficit at $t-1$. Nevertheless, long term budget deficit targets remain uniform and ACs' budgets must be balanced by 2020.

In spite of AC demands, it seems that the result of implementing the BSL has been rather positive, because data indicates that ACs' budget deficits and debt levels remained under control (debt/GDP ratio reached its maximum at 6.5% in 2005 and its minimum at 5.7% in 2007). However, one cannot argue that this is due to the implementation of fiscal rules because from 2001 to 2007 CG and ACs revenues increased continuously.

3.2. Deficit targets in Spain, 2008-2012

Table 1 provides the distribution of deficit targets, decided unilaterally by the CG², across all levels of Administration in Spain during 2008-2012. The first column indicates the deficit target for each administration for each year. The second column shows the proportion of the deficit target assigned to each administration. The third column provides the final deficit achieved by each administration. For 2012 we have introduced an additional column that represents the proportion of total public expenditure managed by each level of administration.

Data in table 1 suggests that deficit targets were evenly distributed across different levels of administration in favour of the central administration. For instance, in 2012 when the proportion of expenditure managed by the CG is above the average for the last 10 years due to the increase in unemployment subsidies, data shows that although CG is responsible for 56% of total expenditure, it self-assigns 71% of total deficit. Data also shows that CG has demanded larger cuts in deficit targets from local and regional administrations. From 2010 to 2011 local and regional administrations were required to reduce their deficit targets by 50% and 46%, respectively, while the effort of the CG was 17%.

The target that is assigned to ACs is the same for each region, in terms of GDP, regardless of their position in the cycle, or regardless of any initial economic factors that influence their cyclical deficit.

However, the problem in Spain is not only that the CG unilaterally decides the distribution of deficit targets but also that the mechanism according to which RGs obtain their resources presents some pitfalls which allow the CG to transfer deficit to ACs.

Finally, we must remark the rapid increase in the level of debt related to public entities, which are not considered when computing Public Administrations' fiscal deficit. According to the Bank of Spain, public debt of these entities represented 2.5% GDP in 2000 while in 2010 represented 5%.

² Regarding deficit targets for ACs, the CG raises a proposal to the Consejo de Política Fiscal y Financiera. Although this proposal is discussed in the Council, it is not subject to negotiation. It must be approved and although 17 regions and two autonomous cities are represented the CG holds the majority. As a consequence, this suggests that there is no real multilateral bargaining process, as the Council is designed as an instrument for validating CG initiatives. At the most, the political bargaining process might be bilateral, with some regions, and in most cases it would simply be validated multilaterally ex-post by majority voting.

Table 1.	DEFICIT TARGETS BY LEVEL OF ADMINISTRATION, 2008-2012														
	2008			2009			2010			2011			2012		
	Target	%	Result	Target	%	Result	Target	%	Result	Target	%	Result	Target	%	Result
Central	0,3		-2,8	0,02		-9,5	-5,9	66%	-5,72	-4,8	75%	-5,13	-4,5	71%	-3,83
Regional	-0,75	100%	-1,49	-0,75	100%	-2	-2,4	27%	-2,94	-1,3	20%	-3,31	-1,5	24%	-1,73
Local	0		-0,48	0		-0,5	-0,6	7%	-0,48	-0,3	5%	-0,45	-0,3	12%	-0,2
Social Security	0,6		0,78	0,8		0,8	0,2		-0,2	0,4		-0,07	0		-0,96
Total	0,15		-3,99	0,07		-11,2	-8,7		-9,34	-6		-8,96	-6,3		-6,72

(1) Deficit targets (expressed as the ration deficit/GDP) correspond to the last figure approved by the CG. Some years deficit targets have been changed at least three times in a year.

Source: Own elaboration

4. THE PROCESS OF FISCAL DECENTRALISATION IN SPAIN

4.1. Financing agreements between CG and RGs: increasing tax autonomy

Very often it is said that the Spanish Autonomous Communities model has a level of decentralisation that goes far beyond that of many countries with federal-type regimes. This might be true with regard to the level of decentralisation of public expenditure (regional and local governments are responsible for a large share of the total expenditure, 44% in 2012) but not with regards to tax autonomy. Attention should be paid to the effective responsibility assumed by ACs because the CG fixes minimum public goods and services that must be provided by ACs that clearly restricts ACs' autonomy in managing such responsibilities.

The main characteristic of the Spanish process of decentralisation is that the level of responsibilities that were devolved to ACs was rather asymmetric at the beginning, although asymmetries had been almost eliminated by 2013. Still, some responsibilities have not been devolved yet to all ACs such as penitentiary, justice, etc.

Another asymmetry concerns the origin of ACs' fiscal revenues. There are two different groups of regions. On the one hand, there are two regions (named Foral Regions³) that manage and collect the most tax revenues and transfer resources to the CG in order to cover the services that the Spanish government is providing in these regions. On the other hand, there are the rest of ACs, which receive transfers (direct transfers or derived from shared taxes) from the CG. RGs in this group of regions also have some revenues that are obtained from own taxes.

The financing agreements that rule such mechanism for the second group of regions since 1987 are rather complex. For simplicity, we refer only to the main characteristics of such agreements:

First, apparently there has been a significant increase in fiscal co-responsibility, for two reasons: i) because the mechanism has moved from a transfer based to a shared tax process, ii) because ACs have been increasing regulatory power on income tax, which is a shared tax, and on some of the taxes that were transferred to them but that were considered as own taxes. Therefore, it seems that tax autonomy has gradually been increasing.

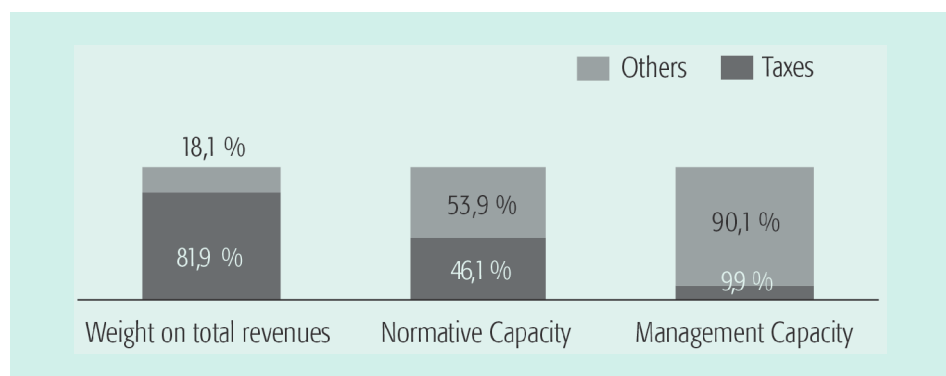
However, some characteristics of the mechanism distort effective tax autonomy. This is due to the fact that the CG has traditionally opposed the creation of new taxes by ACs, even when these new taxes did not overlap with CG taxes and even though ACs had the regulatory capacity to create and regulate them. Additionally, the fact that there are some shared taxes does not mean that ACs can manage or regulate them. For

³ There are also several differences among Navarre and the Basque Country, because in Basque Country fiscal authority corresponds to the Diputaciones forales, which transfer part of their resources to the Basque Government.

instance, the 2009 agreement stated that ACs shared Income Tax (50%), VAT (50%) and Excise Duties (58%) but the possibility of regulating or managing VAT and Excise duties is non-existent (with the exception of the tax rate on the duty of petrol).

In figure 1 we present the different measures of tax autonomy. In the first column we show the distribution of fiscal revenues between taxes and other sources of income for the 2011 financial year. We observe that 82% on their income is obtained from tax revenues. However, this proportion decreases significantly when we consider only those taxes over which regional governments have some kind of regulatory power (they can decide on tax bases, or tax rates, tax credits, etc.), because only 46% of total revenues (including Income Tax) come from taxes that can be regulated by ACs. Finally, the picture changes dramatically when we consider the proportion of revenues obtained from taxes that are managed by ACs. If this is the case, as shown in the third column, one can observe that only 10% of ACs' revenues come from taxes that are entirely managed, and very often entirely ruled, by them.

Figure 1. **TAX AUTONOMY FOR THE AUTONOMOUS COMMUNITIES. 2011 (%)**



Source: Own elaboration.

Second, the mechanism has moved from a bilateral bargaining process based on devolution costs to a mechanism in which ACs' needs were estimated according to some «objective» variables (beginning in 1987). However, the results of any attempt to compute «objective» necessities have been systematically counteracted by the implementation of a guarantee clause that stated that any modification to the mechanism could not result in a decrease of the funds that each AC received prior to the modification (known as the *statu quo* effect). This vertical equalization transfers distorts the initial redistribution because it actually means that those regions that were «over-financed» will continue in that position, and that some regions that should significantly improve their funding according to the model did not do so as much as they should. This result comes from

the fact that the theoretical necessities of the regions are somehow linked to the estimated cost of devolution. To sum up, the final allocation of resources has no systemic relationship either in terms of any sort of needs assessment of the regions or regarding their fiscal capacity or income levels (see López-Casasnovas *et al.* 2014).

Third, since 2009 there exists a powerful horizontal mechanism of equalization aimed at ensuring that all regions have the same resources per capita in order to cover the costs of 'similar' levels of provision of those goods and services that are considered to be essential services (education, health and social services). Nevertheless, this initial redistribution of resources should allow, in principle, the maintenance of certain differences in revenue-raising capacities because that horizontal equalization is implemented on 75% of total tax revenues (plus a lump sum transfer from the CG).

Table 2. REGIONAL FISCAL RESOURCES PER CAPITA (average=100). 2012

	Tax Revenue (1)		Total resources pc (2)		Total resources pc* (3)	
	Index	Ranking	Index	Ranking	Index	Ranking
Madrid	134,2	1	94,6	11	99,80	10
Balearic Islands	122,5	2	100,1	9	100,20	8
Catalonia	118,6	3	98,7	10	99,50	11
Aragon	115,1	4	116	4	110,40	5
Cantabria	114,5	5	125,1	1	125,20	1
Asturias	107,8	6	112,7	6	108,40	5
La Rioja	103,5	7	120	2	118,00	2
Castilla-Leon	100,8	8	115,8	5	108,00	6
Valencia	93,9	9	94	13	95,60	14
Galicia	92,3	10	110,8	7	104,30	7
Castilla-La Mancha	85,3	11	103,4	8	99,00	9
Murcia	83,9	12	93,7	14	95,70	13
Andalusia	79,7	13	94,4	12	96,50	12
Extremadura	76,6	14	117	3	111,80	3
Canary Islands	41,8	15	90,2	15	87,00	15
Total	100		100		100	
Coef. of Variation	0,252771		0,10986		0,09503	

Notes: 1) Tax Revenues relate to all taxes in the system that allocates resources among Autonomous Communities; 2) Total resources relates to the final distribution of financing resources - taxes plus transfers - among ACs for the same level of responsibilities; 3) pc* refers to per capita adjusted population.

Source: Generalitat de Catalunya.

The effect of such Vertical (*Fondo de Suficiencia*) and Horizontal (*Fondo de Garantía*) Equalisation Funds can be observed in table 2. The coefficient of variation of the initial territorial distribution of tax revenues doubles that of the final allocation of fiscal resources across regions, regardless of whether it is calculated considering population or the adjusted population⁴, once the Equalisation Funds have been implemented. This suggests that these transfers are highly redistributive.

Finally, we observe that Equalisation Funds introduce a significant change in the relative position of each region. Some regions with the highest fiscal capacities that contribute the most to horizontal regional transfers (through *Fondo de Garantía*) in per capita terms, obtain fiscal resources per capita that are well below the average, and vice versa. Needless to say that these differences cannot be explained by differences in the resources that should allow provision of similar levels of public goods under similar fiscal effort levels but they are due to the *statu quo* effect.

As result, given that deficit targets are distributed uniformly, it seems obvious that ACs do not have the same opportunities to achieve their target.

4.2. Estimation of tax revenues on shared taxes by the Central Government

Up to now, we have described the main characteristics of financing agreements succinctly. Nevertheless, financing agreements, and in particular since 2002, contain some technicalities that have a significant effect on ACs' revenues. These technicalities suggest that CG could reduce part of its deficit by transferring it to ACs.

This technicality refers to how the CG calculates the resources that are going to be transferred to regions with respect to shared taxes and transfers. The CG estimates revenues for shared taxes and transfers at $t-1$ and notifies these estimates to ACs by October $t-1$. The CG will transfer all estimated resources regardless of whether their calculations were achieved, or not, during period t . Then, at period $t+2$, once real revenues are known, the CG compensates ACs for the difference (results might also be in favour of the CG).

Apparently, this procedure suggests that the CG has not incentives in underestimating RGs' transfers because at $t+2$ it should compensate RGs with additional revenues. However, short run effects matter in real politics.

In table 1 we showed that the CG reduced its deficit from 9.5% in 2009 to 5.72% of GDP in 2010. It is obvious that fiscal transfers to RGs should be reduced as far as tax revenues in shared taxes dropped significantly. However, data in table 3 suggest that a significant portion of the reduction of CG's fiscal deficit in 2010, 2011 and 2012 might have been accomplished by underestimating the resources that should

⁴ Adjusted population is based on real population which is modified by considering several factors that explain different costs of provision of public goods and services (population density, age, dispersion, etc.).

Table 3. **BALANCE BETWEEN ESTIMATED RESOURCES (t)- VALIDATED RESOURCES (t+2) 2007-2011**

(thousand euros)

CC-AA	Balance 2007	% GDP 2007	Balance 2008	% GDP 2008	Balance 2009	% GDP 2009	Balance 2010	% GDP 2010	Balance 2011	% GDP 2011
Catalonia	816.575	0,41%	-690.717	-0,34%	-2.478.108	-1,27%	916.507	0,47%	847.000	0,43%
Galicia	393.029	0,73%	-573.758	-1,02%	-1.600.592	-2,92%	361.682	0,66%	301.000	0,55%
Andalusia	1.426.172	0,98%	-1.475.978	-0,99%	-4.637.439	-3,24%	289.592	0,20%	442.000	0,31%
Asturias	117.325	0,51%	-171.162	-0,72%	-588.064	-2,59%	143.751	0,63%	116.000	0,51%
Cantabria	114.656	0,86%	-125.021	-0,90%	-364.226	-2,73%	105.210	0,79%	35.600	0,27%
Rioja	55.022	0,71%	-46.314	-0,58%	-202.974	-2,59%	61.698	0,79%	14.000	0,18%
Murcia	197.101	0,73%	-160.515	-0,57%	-581.974	-2,14%	104.398	0,38%	133000	0,49%
Valencia	515.569	0,50%	-635.685	-0,60%	-1.707.219	-1,68%	727.551	0,71%	923000	0,91%
Aragon	201.589	0,61%	-171.838	-0,50%	-721.646	-2,22%	156.201	0,48%	119000	0,37%
Castilla-la-Mancha	366.870	1,03%	-265.153	-0,72%	-1.033.694	-2,89%	170.543	0,48%	120000	0,34%
Canary Islands	471.193	1,13%	-340.039	-0,79%	-1.102.358	-2,67%	-46.609	-0,11%	75.000	0,18%
Extremadura	184.287	1,05%	-252.350	-1,39%	-764.378	-4,27%	92.742	0,52%	35.800	0,20%
Balearic Islands	34.643	0,13%	-162.051	-0,60%	-178.377	-0,68%	429.057	1,62%	520.000	1,97%
Madrid	819.831	0,44%	15.069	0,01%	-1.336.223	-0,70%	1.272.225	0,67%	330.000	0,17%
Castilla-Leon	362.226	0,64%	-443.607	-0,76%	-1.439.181	-2,55%	317.551	0,56%	266000	0,47%
Total	6.076.088	0,63%	-5.499.120	-0,55%	-18.736.453	-1,94%	5.102.099	0,53%	4.277.400	0,44%

(*) A positive value represents that at period t the CG underestimated revenues to be transferred to regional governments. These resources are transferred at t+2.

Source: Own elaboration.

be transferred to ACs (equivalent to 0.53% of GDP). One could argue that these deviations are due to unpredictable errors because the CG overestimated also fiscal transfers in 2008 and 2009, meaning that ACs had to pay back this excess revenue. The CG allowed them to pay back within ten years. However, in terms of deficit, the impact was computed on 2010 and 2011 ACs' accounts, which allowed an additional reduction in CG's and caused an increase in ACs' fiscal deficits.

Data in table 3 also indicates that the «error» in the estimation of fiscal transfers to ACs is not uniform across regions because they are evenly distributed. This problem existed in the previous model but it increased since 2011, because those regions (basically regions with an above average tax capacity) receive additional resources aimed at providing them average revenues pc. In 2010 the CG decided that these regions would not receive any advance payment of these resources in 2011, but in 2013 (the same occurred in 2012 and 2013). However, this argument does not apply for 2008 and 2009 where larger asymmetries exist.

Finally, there is another technicality that favours the CG. In 2010 some reforms increasing consumption taxes (VAT and Excise Duties) were introduced. Formally, regions received additional resources associated to these taxes, but effectively the CG reduced Vertical Equalisation Transfers by that amount (see Table 4). In addition to that, it must be remarked that the procedure used by the CG to estimate tax revenue increases due to changes in the economic position of each region or due to tax rates increases is not available to ACs', which again introduces the possibility that tax revenue estimates are biased in favour of the CG.

Table 4. **ESTIMATED REVENUES, 2012-2013. AUTONOMOUS COMMUNITIES**

	2012	2013	Var	Var%
Income Tax	33.588,80	33.161,29	-427,51	-1%
V.A.T	23.368,59	26.781,93	3.413,34	15%
Excise Duties	11.048,28	12.245,76	1.197,48	11%
Vertical Transfers (*)	6.928,38	1.966,30	-4.962,08	-72%
Horizontal Transfers (**)	6.801,64	8.534,27	1.732,63	25%
Total	81.735,69	82.689,55	953,86	1%

(*) Fondo de Suficiencia Global, (**) Fondo de Garantía.

Source: Central Government Budget, 2012-2013.

Altogether, this data suggests that the CG has the possibility to transfer part of its deficit to ACs by underestimating the resources that regions should receive for period t and transfer the difference to $t+2$.

5. ESTIMATING CYCLICALLY ADJUSTED BALANCES IN SPAIN

In general, the literature that estimates the determinants of fiscal balances is based on current deficits as a dependent variable and introduces variables that control for business cycle. Instead, in this paper we use structural balances as our dependent variable.

Structural balances are estimated according to the methodology implemented by the European Commission (see European Commission 1995), the OECD (see *Giorno et al.*, 1995) and the European Central Bank (see *Bouthevillain et al.*, 2001).

Structural balances are estimated in two steps. The first step estimates the cyclical position of the economy by measuring its deviation from its «normal» growth path. In a second step, the impact on the budget of the cyclical position is estimated on the basis of fiscal elasticities. In our paper such elasticities are estimated based on an econometric model⁵. Multiplying the deviations from the reference path by the estimated fiscal elasticities yields the corresponding cyclical components of the various budgetary items. Finally, cyclically adjusted balances are then computed by subtracting the cyclical component from the actual budget balance.

In the next sections we explain briefly how output gaps and tax and expenditure elasticities are estimated as well as the results obtained.

5.1. Output Gap

5.1.1. Methodology

Our series refer to the period 1989-2011. Although it is not a large span, it covers a complete cycle (1994-2008), part of an expansion cycle (1989-1993) and part of a recessive one (2009-2011).

Output gaps are estimated based on the methodology used in *Giorno et al.* (1995), European Commission (1995) and *Bouthevillain et al.* (2001) that consists of applying the Hodrick-Prescott⁶ filter (HP) to the series of real GDP (the log of)⁷. The HP filter parameter was set as $\lambda=100$, the standard value with annual data. As in

⁵ In the appendix we explain the methodology that we implemented in order to obtain large GDP series for each Autonomous Community (both at constant and current prices) that are required for output-gap and elasticities estimates.

⁶ The HP filter is a symmetric centred moving average except at the extremes of the series, where there is a bias problem in estimating both the trend and the cyclical component. Given the special interest in the end of the series when studying the budgets' cyclical component, to avoid the bias problem we extended the GDP series logs with 4-steps ahead forecasts as in the European Commission (1995) methodology. This way the estimated HP trend and cyclical component of the GDP at the last year's available data is based on a symmetric centred moving average filter.

⁷ *Giorno et al.* (1995) also consider a Cobb-Douglas production function for the private sector to compute the potential output. However, this alternative cannot be implemented in our paper due to the lack of data available.

the previous references, we used automatic univariate procedures for forecasting the GDP series, which can easily be reproduced by other researchers⁸.

Once the trend component of real GDP for the period 1989-2011 was obtained for each Spanish region, the output gap was computed as

$$GAP_t = \frac{Y_t - Y_t^*}{Y_t^*},$$

where Y_t is the real GDP in year t and Y_t^* is the trend of the real GDP for year t estimated with the HP filter.

5.1.2. *Output gap estimates*

Estimated output gaps for all ACs during 1989-2011 (see figure 2) present the following characteristics.

First, it seems that there is an almost perfect synchrony in output gaps for all ACs. Output gap estimates present a positive sign for most ACs during 1989 and 1992 and also 2000-2008, while during 1993-1998 and 2010-2011 the output gap presented negative values. However, during 2007 and 2008 all ACs present a cyclical position well above their trend (between 4 and 6 percentage points above), just before the economic downturn. From 2000 on, the sign and size of the output gap allowed the expansion of fiscal revenues and public expenditure, in spite of the fact that the increase in tax revenues was based on unstable fiscal basis (property development, etc.).

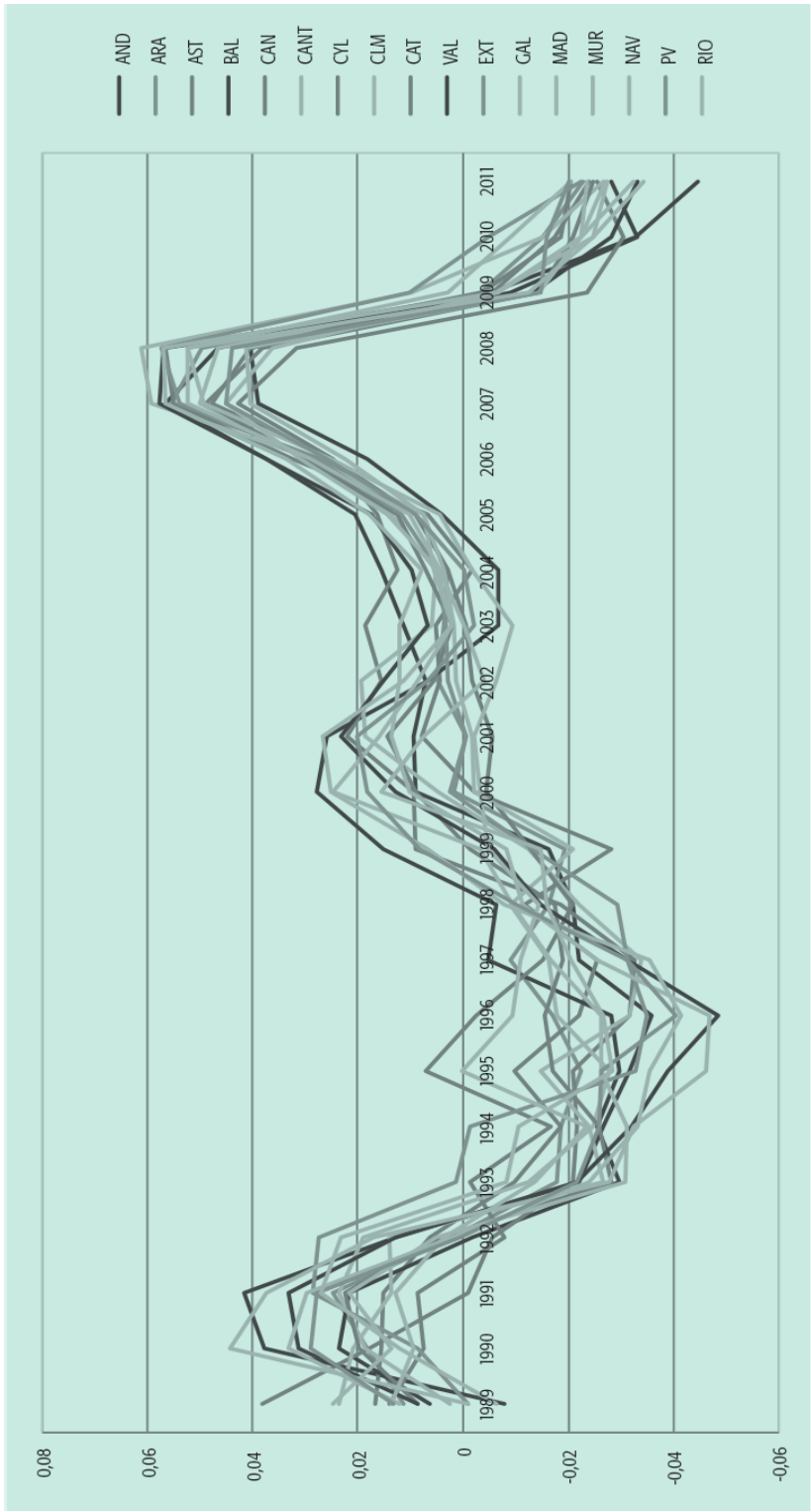
Second, in 2011 all ACs present output gap values that are between 2 and 3.5 percentage points below their trend GDP (the exception being Andalusia which is 4.5% below).

Finally, it can be noted that during the period 1989-2001 there were differences among the cyclical positions of ACs although they were very stable (except in 1995 and 1998). However, from 2002 differences among ACs decrease significantly, to a minimum in 2005, and increase thereafter until 2008, when dispersion in ACs output gaps decreased to the estimated levels for 1998.

Altogether, it seems that regional economies in Spain, as expected, present similar cyclical positions although there are significant differences among regions, which suggests that economic shocks on the Spanish economy do have asymmetric effects on regional economies.

⁸ We used the TRAMO program automatic process to identify the orders of the univariate ARIMA models for the real GDP in Spanish regions. Subsequently, using these univariate models, we proceeded to forecast the series until 2015. Then the extended series with predictions were filtered using the HP filter to obtain the trend component.

Figure 2. OUTPUT GAP 1989-2011 (%)



Source: Own elaboration.

5.1.3. *Income elasticities and cyclically adjusted balances*

In general, the estimation of cyclically adjusted balances takes into account public revenues and expenditures. As far as public expenditure is concerned, only government transfers to households, in particular those aimed at covering costs related to unemployment, are considered. In this paper we do not consider such transfers because ACs are not responsible for unemployment benefits, the CG is. This means that in our estimates original series of public expenditure are considered as structural (or cyclically adjusted).

Another distinctive feature of our estimates is that, although the standard procedure consists of estimating a weighted average of components revenue elasticities (personal taxes, corporate taxes, social security contributions and indirect taxes), the particular structure of ACs' revenues, and the lack of data, brings us to estimate revenue elasticity for each AC considering all sources of income⁹. It seems obvious that ACs' revenues from own taxes and revenue from shared taxes are affected by the cyclical position of their economies. However, due to the mechanism that regulates CGs' transfers to ACs, it can be accepted that they are sensitive to the economic cycle (they depend on the evolution of CG's tax revenues but also on AC's tax revenues and on AC's tax revenues in comparison to all ACs¹⁰).

Once revenue elasticities are estimated, the cyclical component of budget revenue and expenditures is obtained by multiplying the output gap with the budgetary sensitivity. The cyclically adjusted balances are then computed by subtracting the cyclical component from the actual budget balance.

Data in figure 3 indicates that cyclically adjusted balances can be grouped into three different periods. The period that covers 1995-2007 is characterised by a degree of dispersion (the standard deviation of budget deficits ranges from 0.0027 to 0.0070) that is rather low, considering that during this period all ACs alternated negative with positive output gaps. Something similar occurred during 1989-1995, however this period presents larger dispersion values in structural balances, with standard deviation ranging from 0.015 to 0.0038. Finally, there is a third period that covers 2008 to 2011 during which all regions present negative output gaps. In this last period, dispersion among ACs is again rather large, ranging from 0.011 to 0.019.

⁹ We have also estimated similar models for each ACs' sources of revenues (central government transfers, shares of direct taxes and indirect taxes) but due to the continuous changes to the financing system, manifest in structural changes, model estimates were not satisfactory.

¹⁰ Revenue elasticities are estimated using an expression similar to that in Bouthevillain *et al.* (2001)

$$\Delta \ln R_{jt} = \alpha_j + \beta_j \Delta \ln GDP_{jt} + A_j + \varepsilon_{jt},$$

where R_{jt} are total revenues at moment t for AC_j (revenues from own taxes, shared taxes and CG's transfers), GDP_{jt} refers to nominal GDP. A_j is a set of dummy variables associated with the particular nature of financing agreements between CG and ACs, and ε_{jt} is the error term. α_j and β_j are the parameters to be estimated, with β_j being the sensitivity of AC's revenues to GDP. Δ is the lag operator, so that $\Delta \ln x_t = \ln x_t - \ln x_{t-1}$ is the approximate growth rate of variable x_t .

Figure 3.1. **STRUCTURAL DEFICIT/GDP. AUTONOMOUS COMMUNITIES, 1989-2011. Andalusia, Aragon, Asturias, Balearic Islands**



Figure 3.2. **STRUCTURAL DEFICIT/GDP. AUTONOMOUS COMMUNITIES, 1989-2011. Canary Islands, Cantabria, Castilla la Mancha, Castilla León**

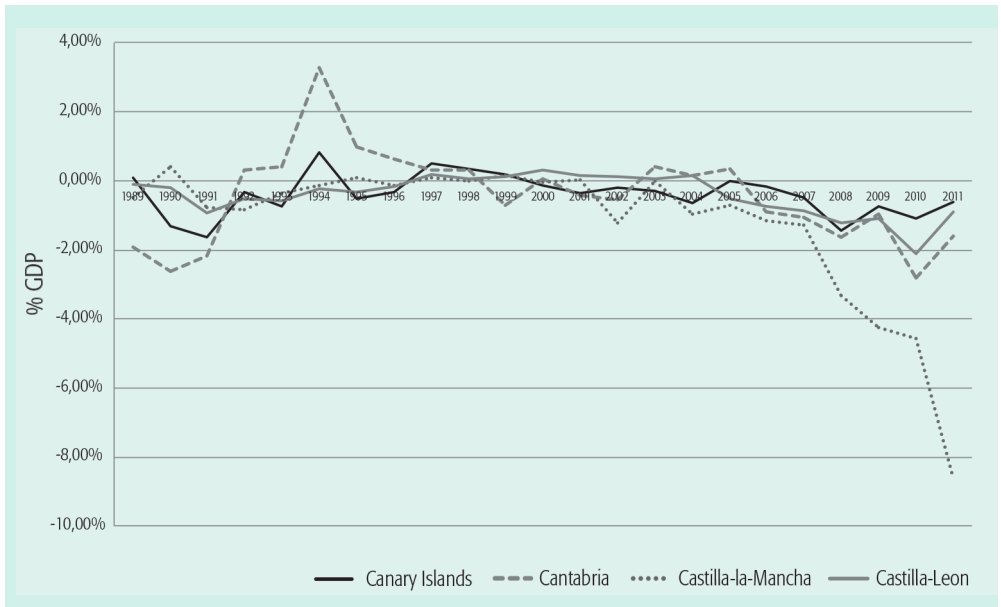


Figure 3.3. **STRUCTURAL DEFICIT/GDP. AUTONOMOUS COMMUNITIES, 1989-2011. Catalonia, Extremadura, Galicia, Rioja**

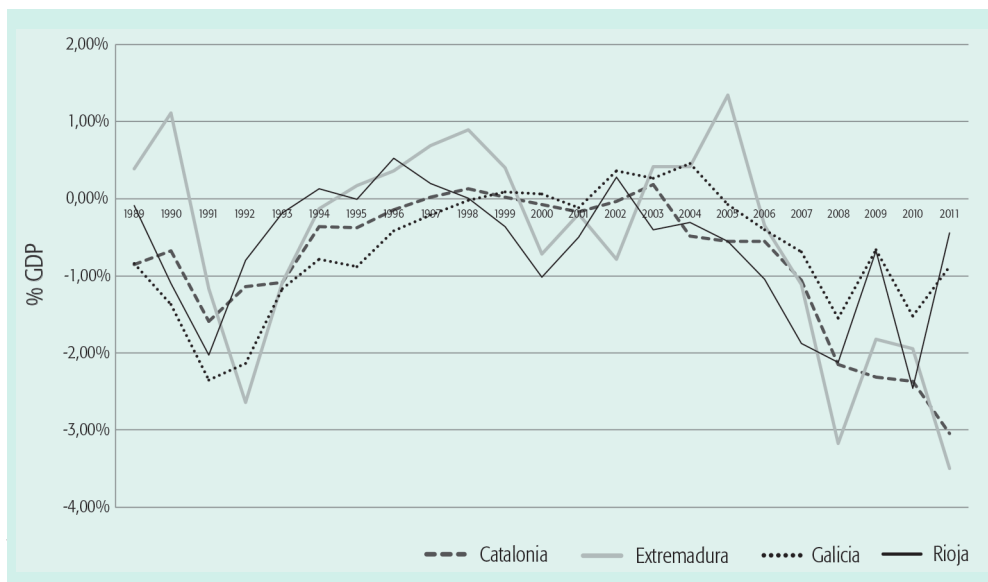


Figure 3.4. **STRUCTURAL DEFICIT/GDP. AUTONOMOUS COMMUNITIES, 1989-2011. Madrid, Murcia, Navarre, Basque Country, Valencia**



Source: Own elaboration.

As a consequence, data suggests that there are significant differences among AC's cyclically adjusted fiscal balances, and it is rather unlikely that these differences can be attributed to the cyclical position of each region.

In the next section we analyse which factors explain such differences. Given that it seems that the economic cycle is the same for all regions (although with different intensities) it is interesting to analyse to what extent ACs' differences in fiscal balances are explained by institutional and political variables, as well as by the financing agreements that determine resources to be received by ACs.

6. THE DETERMINANTS OF RGS CYCLICALLY ADJUSTED BUDGET BALANCES

6.1. Methodology

In order to run our empirical analysis, we use the methodology that is standard and that has been used in the different articles mentioned in the literature that analyses similar issues based on Spanish data. It is worth mentioning that there are other contributions related to the analysis of political economy data. In particular, in Beck and Katz (2011) and Beck (2001), the authors suggest that the analysis of panel data models should be addressed using OLS with panel correct standard errors rather than GLS. In addition to that, the authors suggest that dynamics could be modelled via lagged dependent variables (which is what we do in this paper).

In particular, we estimated the level model in first differences, by applying GMM (Arellano and Bond 1990), using lagged regressors as instruments. In order to check for first-order serial correlation in levels, we looked for second-order correlation in differences. The problem with the Arellano-Bond test is that it depends on the assumption that N is large and, as suggested by Rodman (2009): «applying it to panels with $N=20$, seems worrisome». In our dataset N takes the value 17. We mention this apparent pitfall because for some definition of the dependent variables (structural primary deficits over GDP and structural deficit over non financial instruments) in some of the estimations $M2$ is significant, which suggests that there might be an autocorrelation problem in two-step GMM. Nevertheless, this problem is not present for one-step GMM.

We also present the results of the Sargan test, which tests the validity of the overidentification restrictions and is asymptotically distributed as a χ^2 . However, as reported by Roodman (2009), the test is subject to errors that depend on the number of instrumental variables. In fact, we found significant differences in this test depending on whether we estimated one-step or two steps GMM. In particular, one-step GMM rejects the null hypothesis of valid overidentification restrictions, while two-step GMM corrects such bias.

However, none of these problems exist when we use cyclically adjusted balance (also denoted as structural balance) over GDP as our dependent variable.

6.2. Explanatory variables

There are an extensive number of variables that have been used as explanatory factors to ACs budget balances. Traditionally they have been classified into two groups. Table 5 shows the variables that we used in our estimates.

Table 5. DETERMINANTS OF STRUCTURAL FISCAL BALANCES IN SPANISH ACs

	Description	Value	Expected Sign on Budget Balances
INSTITUTIONAL VARIABLES			
TotalResources FA	Total Revenues pc obtained by ACs from each FA	Euros	Negative
FA	Financing agreement for the Autonomous Communities 1995-1996, 1997-2001, 2002-2008 and 2009-2010	1/0	?
Tax Autonomy	Ratio Revenues from Own taxes and shared taxes (excluding excise taxes and VAT) over Non Financial Income	%	?
Transfers	Ratio Transfers received by ACs over Non Financial Income	%	?
DebtPublicSector/GDP		%	Negative
CGDeficit/PIB	CGBudget deficit over GDP	%	Positive
CGDeficit (t-1)	CGBudget deficit over GDP at t-1.	%	Positive
POLITICAL VARIABLES			
PolCoincidence	Coincidence between political parties governing ACs and the CG	1/0	Negative
Right	Right-wing ruling parties at ACs	1/0	Negative
Left	Left-wing ruling parties at ACs	1/0	Positive
Nationalist	Nationalist ruling parties at ACs	1/0	Positive
ECONOMIC VARIABLES			
Interest Rate	Ratio Interest payments over Total debt	%	Positive

Source: Own elaboration.

In the first group, economic factors are included. Variables such as economic cycle, interest rates, income per capita, income inequality and, to a lesser extent, inflation and asset prices, have traditionally been considered as potential determinants of budget balances. In this paper we omit most of these variables because they tend to capture the position of a Government's fiscal balance according to cycle and, as we mentioned, we are working with structural fiscal balances, thus correcting for its cyclical component. Nevertheless, we introduce the estimated interest rate because it captures the cost of the total debt issued by a government at moment t . We expect that higher interest rates might increase budget deficits because it is very unlikely that unexpected increases in interest rates at period t be compensated with a unexpected reduction in public expenditure or an increase in tax rates (the potential revenues of tax rates increased unexpectedly at period t are rather small) while the budget is being executed.

The second group of variables is made up of those referring to political factors. Political instability, ideology and electoral-cycles are very often used as explanatory variables to budgeted balances. As an explanatory variable, we introduced Political Coincidence, which refers to the coincidence (or not) in the ideology of ruling parties at ACs and the CG (it takes the value 1 if there is coincidence and 0 otherwise). We expected that if there is political coincidence the CG will favour related ACs by transferring more resources to them or by financing their capital expenditure, while unrelated ACs may have to finance capital expenditure with their own resources. Another political variable is the ACs political orientation of their ruling parties. It is commonly expected that nationalist and left-wing oriented ruling parties tend to present higher budget deficit levels than right-wing oriented parties.

Finally, there is a third group of variables that refer to institutional factors, which is where the reader will find our main contribution to the literature. The existence of budgetary institution and variables related to the implementation of fiscal rules are the most commonly used variables in the literature. Nevertheless, we argue that the existence of these institutions does not guarantee that fiscal rules are implemented or that there is coordination among different levels of governments. In Spain a budgetary institution exists (see footnote 1), but instead of fostering institutional coordination it is fostering institutional disloyalty (see Lopez-Casasnovas *et al.* 2014). Two different groups of variables are introduced concerning institutional factors. We try to go beyond traditional variables computed based on general definitions concerning the level of decentralization, tax autonomy, etc. and we compute new variables that consider some of the technicalities that characterize fiscal relationships between CG and RGs that we detailed in section 4.

On the one hand, we introduce two variables that are associated with potential strategic behaviours of CG and ACs. First, we introduce the ratio of ACs' Public Debt in relation to their Public entities over GDP. Our argument is that fiscal rules on ACs can be circumvented by deviating AC's fiscal deficit to those ACs' public en-

tities that are not considered when computing AC's fiscal balance. This explains, in Spain, the fact that there has been an enormous increase of such public entities, and their debt. Every time the CG introduces more restrictions on such entities, ACs (and also the CG itself) created new entities with different legal status. Therefore a negative sign is expected for this variable. Second, we introduced CG's Budget Deficit. We argue that CG can be tempted to reduce its deficit by transferring it to ACs. We introduced two lags in this variable. A positive sign is expected in this variable, which means that the larger the CG budget deficit, the more tempted the CG will be to transfer it to ACs. Alternatively, one may argue that this is an endogenous variable, because the CG may generate budget deficit by increasing the amount of resources aimed at relieving ACs' budget deficits. However, as we mentioned earlier, the financing agreements between the CG and ACs prevent this occurring, because this would increase ACs' budget deficits at $t+2$. In addition to this, as we have already mentioned, the CG unilaterally controls the process through which ACs receive their resources and also the allocation of deficit targets between and within different levels of government.

On the other hand, we introduce some variables relating to the financing agreements between the CG and AC. In this group of variables we include the Total Resources per capita available to each AC (a negative sign is expected, meaning more resources – regardless of whether they come from taxes or transfers – available to ACs to allow fiscal deficits to be reduced). This variable is measured considering estimated revenues on shared taxes and transfers to ACs from the CG at period t plus the compensation received by ACs due to the difference of estimated revenues and effective revenues at $t-2$.

We also introduced a *dummy* variable with the intention of capturing the specificity of each financing agreement (FA1, FA2, FA3 and FA4). Given that renovation of financing agreements has tended to increase the degree of tax autonomy, this variable might be interpreted as a proxy for tax autonomy. Additionally, we introduced two different direct measures of tax autonomy. The first one is the Total Transfers over Total non Financial Revenues ratio. The second one was measured based on Total Revenues from Own Taxes (plus Income tax, which is a shared tax and which can be slightly regulated by ACs) over Non Financial Revenues. No expectations were made in relation to the sign of such variables because, while some authors suggest that more tax autonomy is expected to make ACs more responsible (a positive sign would be expected for FA1, FA2 and FA3 in comparison to FA4), some others argue that with more tax autonomy ACs' revenues largely depend on the tax basis evolution, while ACs expenditure are rather structural¹¹.

¹¹ They are considered as structural because most of ACs public expenditure is devoted to health, education and social services which are characterised by being rather rigid in relation to the business cycle. In addition to this, we must remember that the CG fixes public services that must be provided compulsorily by ACs to their citizens.

Table 6. DETERMINANTS OF CYCLICALLY ADJUSTED BUDGET BALANCES IN SPANISH ACS (1994-2010)

Dependent	Structural Deficit/GDP				Structural Primary Deficit/GDP				Structural Deficit/ NonFinancialRevenues			
	One Step		Two Steps		One Step		Two Steps		One Step		Two Steps (No Robust)	
Method	Coef	Std Error	Coef	Std Error	Coef	Std Error	Coef	Std Error	Coef	Std Error	Coef	Std Error
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(7)	(8)
Dependent (t-1)	.32439	.094269(*)	-.69252	1.19469	.85671	.0559278(*)	.61885	.5663681	.34251	.0618936(*)	-.01409	.57247
DebtPS/GDP	-.00505	.001828(*)	-.006221	.002407(*)	-.00604	.0023062*)	-.00811	.0055177	-.05440	.0169713(*)	.03181	.07059
InterestPayments					-.02755	.0809359	-.07567	2.63768				
Transfers	.00125	.008312	.006185	.006857	.01876	.0090649(*)	.00162	.0246863	.10977	.0828155	.55335	.47893
OwnTaxes/NFR	.01582	.009718	-.001936	.0128092	.01527	.0150213	-.01295	.0354532	.07903	.0293111	.53864	.46460
Interest Rate	.03000	.058046	.129567	.0999648	.05801	.0427933	.00923	.750401	.04795	.2606103	-.13.261	10.7791
PolCoincidence	.00027	.000959	-.003565	.0012552(*)	.00028	.0015222	-.00216	.0050774	.00729	.0094786	-.11394	.08936
Left	.00372	.003018	-.003087	.0043975	.00909	.0034583(*)	-.00070	.0069198	.01960	.0158335	-.17790	.15334
Nationalist	.00424	.002371	-.013083	.0077674	.00193	.0028804	-.00099	.0109532	.02491	.0263512	-.48569	.42011

.../...

.../...

FA1	-.01479	.0071208(*)	-.099606	.0382234(*)	-.03520	.0094229(*)	-.01664	.1139227	-.11382	.0446458(*)	-3.4656	3.10392
FA2	-.01984	.007555(*)	-.120246	.0472453(*)	-.04356	.0103745(*)	-.01764	.1204125	-.15751	.0535055(*)	-4.7827	4.13960
FA3	-.01520	.0053924(*)	-.112554	.046814(*)	-.03130	.0067097(*)	-.01221	.1037192	-.09306	.0338233(*)	-4.3352	3.77438
TotalResources FA	-.00001	-2.82e-06(*)	-.000031	.0000138(*)	-.00001	3.30e-06(*)	-1.45e-06	.000021	-.000062	.0000156(*)	-.001453	.00119
CGDeficit/GDP	.11420	.04278279(*)	1.051318	.6346653	.13259	.04692559(*)	.14269	.9525278	.68857	.2654723(*)	41.2939	37.2156
CGDeficit (t-1)/GDP	.15650	.05544859(*)	.946327	.3980151(*)	.27707	.08572701(*)	-.11059	.9608626	1.13658	.430858(*)	40.3411	33.8649
Constant	.02409	.0081957(*)	.194034	.0775031(*)	.04633	.0129018(*)	.02828	.1520907	.17136	.071197(*)	8.83695	7.30171
Obs.	272	272	272	272	272	272	272	272	272	272	272	
TSargan	0.0000			1.000		0.000		1.000		0.000		1.000
Arellano-Bond												
M1	0.0044		0.4675		0.0092		0.3365		0.0077		0.2766	
M2	0.2451		0.2505		0.0951		0.3063		.3731		0.0809	

Note: estimation in first differences via GMM using as instruments regressors lagged two periods. Robust standard errors in brackets. (*) denote statistically significant at 5% level of confidence. TSargan captures the p-value corresponding to the Sargan Test and M1 and M2, provide the p-value corresponding to the first and second order correlation test for the residuals.

Source: Own elaboration.

A *dummy* variable was introduced for each region, which is particularly interesting for those regions with special status (Navarra, the Basque Country and the Canary Islands) and a variable that measures the different degrees of devolved responsibilities (as provided for in articles 143 and 150 of the Spanish Constitution).

Given that we introduce so many variables, it is very likely that multicollinearity among the regressors exists. In order to control for multicollinearity we analyzed the matrix of correlations and we identified some variables such as Transfers, Interest rate, Sf3, and Total Resources. Given that there is not a standard solution to this problem, we proceeded estimating each of the regressions introducing all variables and then we did the same exercise eliminating those variables that were supposed to introduce multicollinearity. In any of the estimates deleting Interest rate and Transfers, which are not significant in most estimates, we did not observe that the estimations changed significantly, this is why we present the estimates introducing these variables. To what concerns Sf3 and Total Resources, they are highly correlated, but Sf3 is a dummy variable and it seems that there is no relationship between both variables. As expected, results did change slightly, but we decided to maintain both variables in order to avoid the biased caused by omitting relevant variables.

6.3. Results

We used three different definitions of cyclically adjusted budget balances. Results are presented in table 6 and the results for each definition of the dependent variable refer to one-step and two-steps GMM.

Although we have calculated many regressions, we only present some of the results in this section because very often the variables were not significant, or because we dropped them due to multicollinearity problems (this occurred when we introduced cross effects among Transfers/GDP and Financing Agreements, for instance).

Estimations by two-step GMM (columns 3 and 4) are the best because the Sargan test accepts the null hypothesis of valid overidentification restrictions and because M2 indicates that there is no second-order correlation. These are the estimations that we are going to comment in the following paragraphs.

The most interesting result is that estimates confirm that CG budget balance, at period $t-1$, is significant and it has a positive effect on ACs' budget balances. This suggests that the CG can affect ACs' budget balances, which is an issue that was not previously considered in the literature, by transferring its deficit to ACs. However, one could interpret that this result is due to the fact that AC's budget balances cause CG's budget balance because the CG has to bail out ACs' governments. Nevertheless, this is clearly not what occurred during the 2008-2011 period and it is something that financing agreements prevent from occurring because any deviation in favour of ACs at period t is necessarily adjusted at period $t+2$. In addition to that it is obvious that if Financing Agreements are based on shared taxes, if tax revenues decrease, so will transfers from the CG. However, we must remind that we are working with structural fiscal deficits, meaning that the cycle effect is already considered.

A second result suggests that ACs may behave strategically when fiscal rules are tightened because the variable DebtPS/GDP is significantly negative. This indicates that ACs might try to prevent fiscal rules by increasing the budget deficits (and debt) of the institutions that have a specific legal status. This interpretation is also validated based on the data that shows significant increases in the number of public entities, precisely during the period when BLS was implemented.

Table 7. **MAIN STATISTICS**

	Obs	-0,004176	Std Dev.	Min	Max
StructuralDeficit/GDP	289	0,0096828	0,0098349	-0,0456574	0,0329434
Structural PrimaryDeficit/GDP	289	0,4847751	0,0364597	-0,0426008	0,1900578
DebtPS/GDP	289	0,4934328	0,6321068	0	3,3
Transfers	289	0,358736	0,2413824	-0,2767024	0,9693747
OwnTaxes/NFR	289	0,358736	0,2205676	0,0694184	0,9742702
InterestRate	289	0,0555339	0,0262841	0,0025248	0,1702213
Interest Payments	289	0,0260824	0,0250556	0,0007897	0,1821598
TotalResourcesFA	289	1837,72	974,4939	198	4232
CGDeficit	289	-0,0002406	0,0002768	-0,00093	0,00012

Source: Own elaboration.

A third result relates to political variables. It seems that only Political Coincidence has some impact on AC's budget balances, suggesting that the CG might favour related ACs by transferring more resources to them or by financing their capital expenditure. On the contrary, it seems that there is no clear empirical evidence that the ideology of ruling parties explains different levels of budget balances among ACs, which suggests that right-wing oriented ruling parties also generate fiscal deficits as much as left-wing and nationalist oriented ruling parties do.

Fourth, with regard to the effects of financing agreements on ACs budget balances we find that the Transfers/Total Income ratio, which is a measure of tax autonomy, does not have any impact on ACs budget balances. Another measure of tax autonomy is implicit in the *dummy* variable that refers to each of the financing agreements. Given that tax autonomy has been increased in each of the financing agreements, one could interpret, as it is, that FA4 is the one in which tax autonomy reached its maximum level. Accordingly, a negative sign in FA1, FA2 and FA3 suggests that agreements characterised by providing low levels of tax autonomy had negative effects on ACs budget balances (budget deficits were lower under FA1, FA2 and FA3), in comparison to FA4. Alternatively, one could make the interpretation that tax autonomy has a positive effect on ACs budget deficits. This result is the op-

posite of that in Argimón *et al.* (2012), who found a positive role for the degree of fiscal co-responsibility on regional fiscal balances. Their interpretation of that result is that there is a positive association between a greater restraint in public accounts and a higher degree on regional control over revenue and expenditures¹². Nevertheless, our result is not unexpected because while ACs expenditures are rather structural (public expenditures are rigid with significant cuts in the short term), tax autonomy makes ACs more dependent on the evolution of their tax basis¹³.

Finally, our estimates indicate that the amount of effective resources that Financing Agreements provide to ACs has a negative effect on ACs budget balances. Although the coefficient is very small, it seems that the larger the amount of resources effectively available to ACs, from Financing Agreements, the lower the ACs' budget deficits.

Even though for one step GMM estimations the Sargan test rejects the null hypothesis, results indicate that almost all variables maintain their significance, with the exception of Political Coincidence.

Regarding the other definitions of our dependent variable, we must point out that two step GMM estimates are very poor because none of the variables are significant. Although one-step GMM estimates (columns 5 and 6, and 9 and 10) show similar results to those arising when Structural Balances/GDP is considered as our dependent variable these results should be taken with some caution because the Sargan test rejects that overidentifying restrictions are valid. The only difference is that when we take Structural Primary Balance as our dependent variable, variable Transfers have a positive impact on ACs' budget balances, a result that would suggest that more tax autonomy is associated with lower deficit levels, a result that coincides with that in Argimón *et al.* 2012. In addition, the variable associated with left-wing oriented ruling parties indicates that AC's ruled by these parties may present higher levels of budget deficits.

7. CONCLUSIONS

In this paper we set out analysis of the factors that explain subnational budget balances. To sum up, the main contribution in this paper is that we use new variables that try to solve the shortcomings that characterize traditional definitions of variables that do not consider those technicalities that characterize fiscal relationships among different levels of governments in Spain.

From an empirical perspective our main findings are the following. First, our results show that ACs' budget balances depend on the size of the deficit run by the CG

¹² We must remind that Argimón *et al.* (2012) analysed the period 1984-2004, thus excluding part of the period in which the Spanish economy presented positive, large growth rates and the period (starting in 2009) where the economic downturn started. In addition to this, they do not analyse the effects of the financing agreement settled in 2009, which presents the largest level of tax autonomy for ACs.

¹³ We also crossed FA and Transfers, however some of the variables were deleted due to multicollinearity problems and for the ones that remained in the estimates we did not obtain any significant coefficient.

and on the mechanism that allows the CG to decide the amount of resources to be received by ACs. Our results suggest that the CG can transfer its deficit to ACs. Second, we show that RG's act strategically by using public entities' budget deficits in order to circumvent fiscal rules designed by the CG. Finally, another contribution of our paper is a methodological one because we work with cyclically adjusted balances based on our own estimates of output gaps and revenue elasticities for each AC. The previous literature has dealt with short term budget deficits and considering revenues and expenditure elasticities computed on country data. However, long term deficit targets fixed by the EU are both for structural balances as well as current deficits.

From a policy-maker's perspective, several implications derive from our empirical findings. First, results suggest that deficit targets should not be distributed linearly across ACs and should not be expected to be fulfilled in the same time-horizon because financing agreements generate asymmetries among regional governments (regardless of their position in the economic cycle). Second, and more important, that financing agreements should be re-designed in order to prevent the CG having the opportunity to transfer its deficit to regional governments (beyond the expected effects due to their own cycle). Finally, our results suggest that more budgetary co-ordination is needed in order to prevent that ACs circumvent central governments fiscal rules using their public entities.

BIBLIOGRAPHIC REFERENCES

- ARELLANO, M. and BOND, S. (1991): «Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment», *Review of Economic Studies*, Vol. 58, Issue 2, April, 277-297.
- ARGIMÓN, I. and HERNÁNDEZ DE COS, P. (2012): «Fiscal rules and federalism as determinants of budget performance: an empirical investigation for the Spanish case». *Public Finance Review*, 40(1) 30-65.
- BANK OF SPAIN (2013): Boletín Estadístico. 12/2013, 246.
- BARRIOS, S. and MARTÍNEZ, D. (2013): «Fiscal equalisation schemes and sub-central government borrowing». Documentos de Trabajo IVIE. WP-EC 2013-03.
- BBVA (2015): *Situación España*. BBVA Research, Second Trimester 2015, 45-47.
- BECK, N. (2001): «Time-Series-Cross-Section Data: what have we learned in the Past Few Years?» *Annual Review of Political Science*. Vol 4, 271-293.
- BECK, N. and KATZ, J.N. (2011): «Modelling Dynamics in Time-Series-Cross-Section Political Economy Data». *Annual Review of Political Science*, vol 14, 331-352.
- BORDIGNON, M. (2006): «Fiscal Decentralization: How to Harden the Budget Constraint». In *Fiscal Policy Surveillance in Europe*, edited by Elena Flores Peter Wierts, Servaas Deroose and Alessandro Turrini, chap. 6. New York: Palgrave Macmillan, 109-136.
- BOUTHEVILLAIN, C. *et al.* (2001): «Cyclically Adjusted Budget Balances: an alternative approach». European Central Bank, Working Paper Series, WP n° 77, September 2001.
- DEBRUN, X., MOULIN, L., TURRINI, A., AYUSO-I CASCALS, J. and KUMAR, M.S. (2008): «Tied to the Mast? National Fiscal Rules in the European Union.» *Economic Policy* 23 (54):297-362.
- EUROPEAN COMMISSION. DIRECTORATE-GENERAL FOR ECONOMIC and FINANCIAL AFFAIRS (1995): «The Commission services' method for the

cyclical adjustment of government budget balances». *European Economy*, 1995, 35.

- FERNÁNDEZ-LEICEAGA, X. and LAGO-PENAS, S. (2013): «Sobre el reparto de los derechos de deficit entre las Comunidades Autónomas, una propuesta alternativa». *Revista de Economía aplicada*, nº 63 (vol XXI), 2013, 117-136
- FOREMNY, D. (2014): «Sub-national deficits in European countries: The impact of fiscal rules and tax autonomy». *European Journal of Political Economy*, vol 34. June 2014, 86-110.
- GARCÍA-MILÀ, T. and MCGUIRE, T. (1990): «The effects of central government financing on regional government expenditures in Spain. Public finance with several levels of government». *Proceedings of the 46th Congress of the International Institute of Public Finance* (Ed) R Prud'homme, IIPF, Brussels.
- GIORNO, C. *et al.* (1995): «Estimating potential Output, Output Gaps and Structural Budget Balances». OECD Economics Department Working Paper, nº 152.
- GOODSPEED, T.J. (2002): «Bailouts in a Federation». *International Tax and Public Finance* 9 (4):409-421.
- HALLERBERG, M., STRAUCH, R. and VON HAGEN, J. (2007): «The design of fiscal rules and forms of governance in European Union countries», *European Journal of Political Economy* 23 (2):338-359
- HERNÁNDEZ DE COS, P. and PÉREZ, J.J. (2013): «Subnational Public Debt in Spain: political economy issues and the role of fiscal rules and decentralization» in *Fiscal Relation across governments levels in times of crisis –making compatible fiscal decentralization and budgetary discipline*. *European Economy. Economic Papers*, 501.
- LAGO-PENAS, S. (2005): «Evolving federations and regional public deficits: testing the bailout hypothesis in the Spanish case», *Environment and Planning C: Government and Policy* 2005, Vol. 23, 437-453.
- LÓPEZ-CASASNOVAS, G. and ROSSELLÓ-VILLALONGA, J. (2014): «Fiscal Imbalances in Asymmetric Federal Regimes. The Case of Spain». *Revista de Hacienda Pública*, 209- (2/2014):55-97.
- MOLINA-PARRA, A. and MARTÍNEZ, D. (2015): «Do federal deficits motivate regional fiscal (im)balances? Evidence for the Spanish case». *Documentos de Trabajo Centro de Estudios Andaluces*. DT 001/15.
- MONASTERIO, C. and SUÁREZ-PANDIELLO, J. (1993): in *El Endeudamiento autonómico: Teoría y evidencia empírica*. Bilbao, Fundación BBVA
- MUSSONS, J. (2013): «Fiscal policy responses to changes in the cyclical position of the Spanish Autonomous Communities: an empirical analysis». Paper presented at Encuentro Economía Pública, Girona 2014.
- PÉREZ, F. and CUCARELLA, V. (2013): «Determinantes de la diferencias entre CC.AA en la evolución del déficit y el nivel de endeudamiento». IVIE, Serie EC, WP EC 2013-04.
- RODDEN, J. A. (2002): «The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World». *American Journal of Political Science* 46 (3):670-687.
- (2006): *Hamilton's Paradox: the Promise and Peril of Fiscal Federalism*. Cambridge Studies in Comparative Politics. Cambridge University Press.
- RODDEN, J. A., ESKELAND, G.S. and LITVACK, J. (2003): *Fiscal Decentralization and the Challenge of Hard Budget Constraints*. The MIT Press.
- RODMAN, D. (2009), «How to do xtabond2: An introduction to difference and system GMM in Stata». *The Stata Journal*, volume 9 n. 1: 86-136.
- SORRIBAS-NAVARRO, P. (2011): «Bailouts in a fiscal federal system: Evidence from Spain.» *European Journal of Political Economy* 27 (1):154-170.
- VON HAGEN, J. (2005): «Political Economy of Fiscal Institutions.» In *Oxford Handbook on Political Economy*, Barry Weingast and Donald Wittman (Editors). Oxford University Press, 464-478.
- (2006): «Fiscal Rules and Fiscal Performance in the European Union and Japan.» *Monetary and Economic Studies* 24 (1):25-60.
- VON HAGEN, J. and EICHENGREEN, B.: (1996): «Federalism, Fiscal Restraints, and European Monetary Union.» *American Economic Review* 86 (2): 134-138.
- WILDASIN, D.E. (1997): «Externalities and bailouts: Hard and soft budget constraints in intergovernmental fiscal relations.» Policy Research Working Paper Series 1843, The World Bank.

APPENDIX

We describe the time series used to compute the output gap (real GDP) and the elasticities (current GDP) of the Spanish Autonomous Communities. Time series come from different sources and methodologies that had to be linked. The general criteria was to use the most recent official data from INE, the Spanish national statistical agency, and link back to the other sources and methodologies by applying the growth rates retrospectively. The last methodological base for regional accounts relates to 2008 (CRE08), and is the one used by central Government to compute public deficit. Therefore, these series are enlarged back in order to make predictions and calculate the output gap (real GDP) and to estimate elasticities.

Thus, the series of real GDP for the period 1989-2011 were built linking the following series:

- Growth rates of the CRE08 chained volume indices covering 2009-2011. Data corresponding to 2009 and 2010 were provisional and 2011 was a first estimation.
- Growth rates of the chained volume indices of INE regional accounts with a methodological base in 2000 (CRE00), for 1996-2008 Data relating to 2007 and 2008 were provisional.
- Real growth rates of the Gross Added Value for Spanish regions for the period 1990-1995 estimated by De la Fuente (2009).

Therefore, based on year 2008, the GDP with base CRE08, which is the only definitive one on this basis, forward and backward growth of rates discussed in the previous three points were applied. The series of GDP at current prices needed to estimate elasticities were built from the CRE08 (2008-2011) retrospectively applying nominal growth rates of CRE00 for the period 1995-2007, and CRE86 for the period 1984-1994.